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HANDBOOK
OVERHAUL INSTRUCTIONS

TYPE B-3
20-TON ADJUSTABLE TRIPOD HYDRAULIC JACK

(JUMBO STEEL PRODUCTS)

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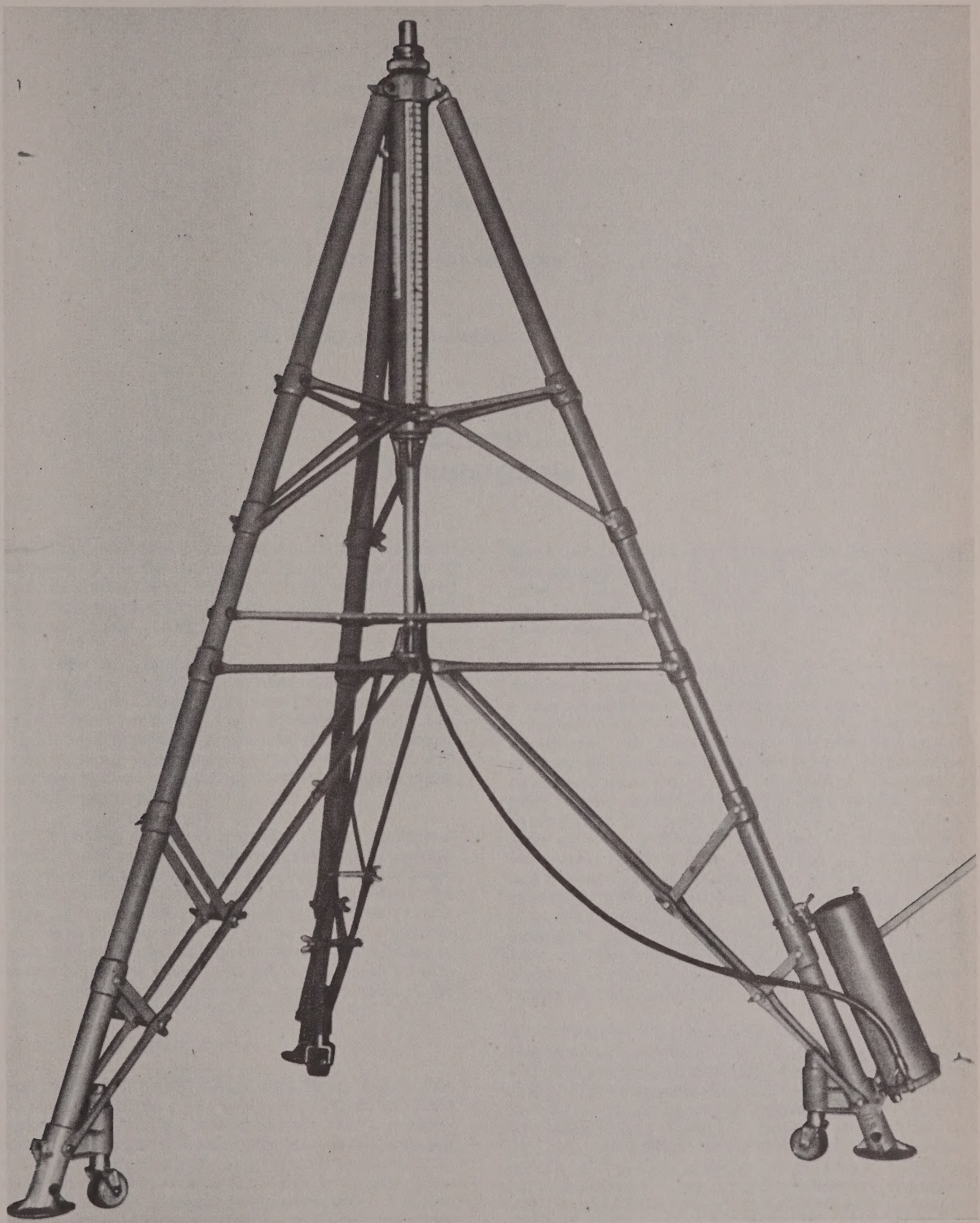

Figure 1-1. Type B-3 20-Ton Adjustable Tripod Jack Assembly

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SECTION I
INTRODUCTION

1-1. This publication contains descriptive data and instructions for the overhaul of the AF Type B-3, 20 Ton Adjustable Tripod Hydraulic Jack, USAF Drawing 44 K 9820, manufactured by the Jumbo Steel Products Company, Azusa, California.

1-2. GENERAL. (See figure 1-1.) The Type B-3 Jack is a portable, single action, hydraulically operated tripod jack with a lifting capacity of 20 tons and a height range of from 4-1/2 feet to approximately 12 feet. The complete jack assembly consists of three principal parts: a pump unit assembly (figure 4-3), a lift unit (figure 4-2) and a tripod assembly which supports the lift unit and pump.

1-3. The jack assembly provides for the pump unit assembly to be clamped to one leg of the tripod structure and connected to the lift unit by a high pressure hose. The lift unit is held upright in the tripod structure. The tripod legs are attached to the top of the lift unit cylinder, with braces attached at the bottom. Various combinations of legs and braces permit adaptability to various heights of loads. The lift unit is equipped with a rise indicator which permits a direct reading of the height in inches that the load has been lifted.

1-4. GENERAL DESCRIPTION.

1-5. PUMP UNIT ASSEMBLY. (See figure 4-3.) This assembly consists principally of a cylindrical fluid reservoir bolted to the base of the pump unit. A separate pump assembly screws into the base, and is actuated by a handle adjustable for long or short strokes. The hydraulic fluid is drawn from and returned to the reservoir through passages in the pump base. A safety shut-off valve is incorporated in the pump base. The function of this valve is to by-pass fluid from the pump passage to the reservoir when certain pre-determined pressures are developed. This provides protection for both the equipment and personnel. A pressure release valve is installed in the base. This valve allows the oil to by-pass the pump when returning from the lift unit to the reservoir.

1-6. LIFT UNIT. (See figure 4-2.) The lift unit consists mainly of a seamless steel tube cylinder which houses a ram assembly and a ram extension screw. The ram is raised by oil pressure forced under the lower end of the lift ram. The outer surface of the ram contains two grooves; one longitudinal and one spiral. Each groove extends from top to bottom of the ram. The ram is guided during its up and down movement by a key which is anchored to a bearing in the top of the cylinder. This key rides in the longitudinal groove. A ram locknut rotates freely (by its own weight) around the ram and travels the route of the spiral groove as the ram is raised. This prevents the load from falling in case of hydraulic failure. The upper end of the lift unit assembly is attached to the upper end of the tripod legs, and the lower end of the lift unit assembly is attached to braces which are in turn attached to a lower section of the tripod legs.

1-7. TRIPOD STRUCTURE. (See figure 4-3.) The tripod structure consists of three tubular legs each with a castered foot assembly. Each leg is connected to the lift unit assembly by means of braces. The basic jack has a closed height of approximately 52 inches. By attaching any one set, or all five sets, of the leg extensions furnished, the over-all height of the basic jack is increased in multiples of 18 inches to 12 feet. All connections of braces and leg extensions are made with bolts and wing nuts which facilitate easy assembly or disassembly. The pump assembly is attached to one leg of the tripod structure by means of a detachable clamp.

1-8. GENERAL SPECIFICATIONS.

TABLE I

JACK ASSEMBLY

Capacity	20 tons
Closed Height	52 inches
Hydraulic Lift Travel	40 inches
Screw Extension Travel	15 inches

LIFT RANGES	CLOSED	OPEN
With no leg extensions	52 inches	107 inches
With 1 leg extension	70 inches	125 inches
With 2 leg extensions	88 inches	143 inches
With 3 leg extensions	106 inches	161 inches
With 4 leg extensions	124 inches	179 inches
With 5 leg extensions	142 inches	197 inches

PUMP UNIT

Reservoir Capacity	3-1/2 gallons
Type of Release	Hand Operated Screw
Safety Valve Overload Setting	10 percent

1-9. PRINCIPLES OF OPERATION.

1-10. The type B-3 Jack is designed to lift loads up to 20 tons by use of the single action hydraulic pump. Actuation of the pump handle forces the pump piston up and down in the pump cylinder, drawing fluid from the reservoir. The oil from the reservoir passes through a ball-type spring-loaded intake valve located in the pump base and up into the pump cylinder. The downward stroke of the piston forces the oil through a ball-type spring-loaded discharge valve also located in the pump base. From this valve, the oil passes through the hose connecting the pump assembly to the lift assembly, and into the bottom of the ram. Continuous actuation of the pump handle will force the oil to raise the ram, in the cylinder of the lift unit assembly, to its maximum height. Lowering of the ram is achieved by turning the handle of the release assembly which permits the oil to flow from the passageway in the pump base back into the reservoir, by-passing the pump. The speed of descent is governed by the release valve, which should be opened wide enough to allow the ram to start down and closed again slowly to adjust for the desired lowering speed.

CAUTION

Because the ram operates only by pressure of oil caused by action of the pump, any oil leakage around openings in the pump base, pump packings, ram packings or any connections will cause pressure to be lost and malfunction of the jack. Therefore any traces of oil leakage should be investigated to determine the seriousness of the leak so remedial action can be taken.

SECTION II
SPECIAL TOOLS LIST

2-1. No special tools are required for the overhaul of this unit. Ordinary mechanic's tools available at any repair depot will be sufficient.

SECTION III
TABLE OF LIMITS

FIGURE AND INDEX NUMBER	PART NUMBER	NAME	DIMENSIONS NEW MAX.	DIMENSIONS NEW MIN.	CLEARANCE NEW MAX.	CLEARANCE NEW MIN.	WORN CLEARANCE MAX.
4-1, 21	44A9859	Piston Cyl.-I.D.	.943	.938	.008		.012
4-1, 15	44A9857	Piston-O.D.	.935	.933		.003	
4-2, 26	44B9827	Jack Cyl.-I.D.	4.317	4.312	.008		.016
4-2, 21	49B6449	Ram Bearings-O.D.	4.309	4.306		.003	

Figure 3-1. Table of Limits

3-1. If the wear on the piston, cylinders or ram bearing exceeds the maximum worn clearance shown in figure 3-1, the worn part should be replaced because the packings will not be able to hold the pressure. Careful measurement of the parts listed above with micrometer gages will disclose any variations from the tolerances tabulated.

SECTION IV
DISASSEMBLY, CLEANING AND INSPECTION

4-1. DISASSEMBLY. (See figure 4-1.)

4-2. REMOVING PUMP UNIT FROM JACK ASSEMBLY.

4-3. Before removing the pump unit from the jack assembly, make certain the ram is completely lowered and the air vent on top of the pump unit is closed.

a. Detach the hose assembly (1) at the bottom of the pump unit. While the detached end of the hose hangs free, screw the cap of the hose connector (2) on the threads to prevent damage to the threads.

b. Turn the handle of the clamp assembly (8) to release the pump unit at the top attaching bracket on the leg. Lift the pump unit up slightly to free the lower attaching lug as shown; then tilt the assembly slightly to drain off through the elbow any oil which might remain in the base.

c. Set pump unit upright on a work bench, remove the air vent assembly (figure 4-5), tilt the unit and drain the oil into a clean container.

4-4. HOSE. (See figure 4-1.) Detach the hose (1) from the lift unit.

NOTE

Approximately a pint of oil will have remained in the hose after it has been disconnected from the pump unit. This oil has not leaked out because of the connector valve located in the pump unit end. However, upon detaching the lift unit end, a clean container should be handy for draining the oil out of the hose through the lift unit end.

4-5. TRIPOD STRUCTURE. (See figure 4-1.)

4-6. With the pump unit removed, place the jack assembly over on one side (with any two legs resting on the floor), and support the lift unit end of the jack assembly on a work bench or wooden horse.

a. Remove the wing nut (13) and bolt (12) from each foot assembly (22). Slide the foot assembly off the leg extension.

b. Detach each succeeding leg extension (23, 45, 54 and 55) by removing the attaching bolts (24, 43, 46, 52, 56) and their supporting braces.

c. Remove the wing nut (4) and detach the pump clamp assembly from the tripod leg.

4-7. LIFT UNIT. (See figure 4-2.)

4-8. With the tripod structure thus removed, the lift unit is free to disassemble.

4-9. ADAPTER. Remove the adapter (1) from the socket assembly (9) and attach it to the safety pin (4) to prevent loss during disassembly of the lift unit.

4-10. RISE INDICATOR. Remove the thumb screw (8) and lift off the rise indicator pointer. Remove the wing nut (7) and detach the rise indicator tube assembly (6) from the collar (14).

4-11. SOCKET ASSEMBLY. Remove the socket assembly (9) from the screw assembly (10).

NOTE

A spring-loaded ball holds the socket assembly within the screw assembly. A sharp twist is required to depress the plunger and free the socket assembly.

4-12. SCREW ASSEMBLY. Turn the screw assembly (10) along with the lock nut (11), by hand, out of the ram bearing nut (19). Notice that the ram bearing nut is screwed into the top of the ram. Remove the lock nut (11) from the lower end of the screw.

NOTE

A spring-loaded plunger is employed in the screw to prevent its being turned accidently out of the ram. When removing the lock nut (11), a sharp twist is required to make the nut pass over the plunger.

4-13. RISE INDICATOR COLLAR. The rise indicator collar (14) is held in place by a clamp (12). The clamp in turn is secured by four screws (13) to a nut (24). Remove the screws to disassemble.

4-14. RAM LOCK NUT. To remove the ram lock nut (17), which rides the external groove of the ram, loosen the screw (16) and rotate the lock nut upwards to the top of the ram.

4-15. RAM. Pull the ram (25) upwards to relieve pressure on the threads. Unscrew bearing (19) from the top of the cylinder (26).

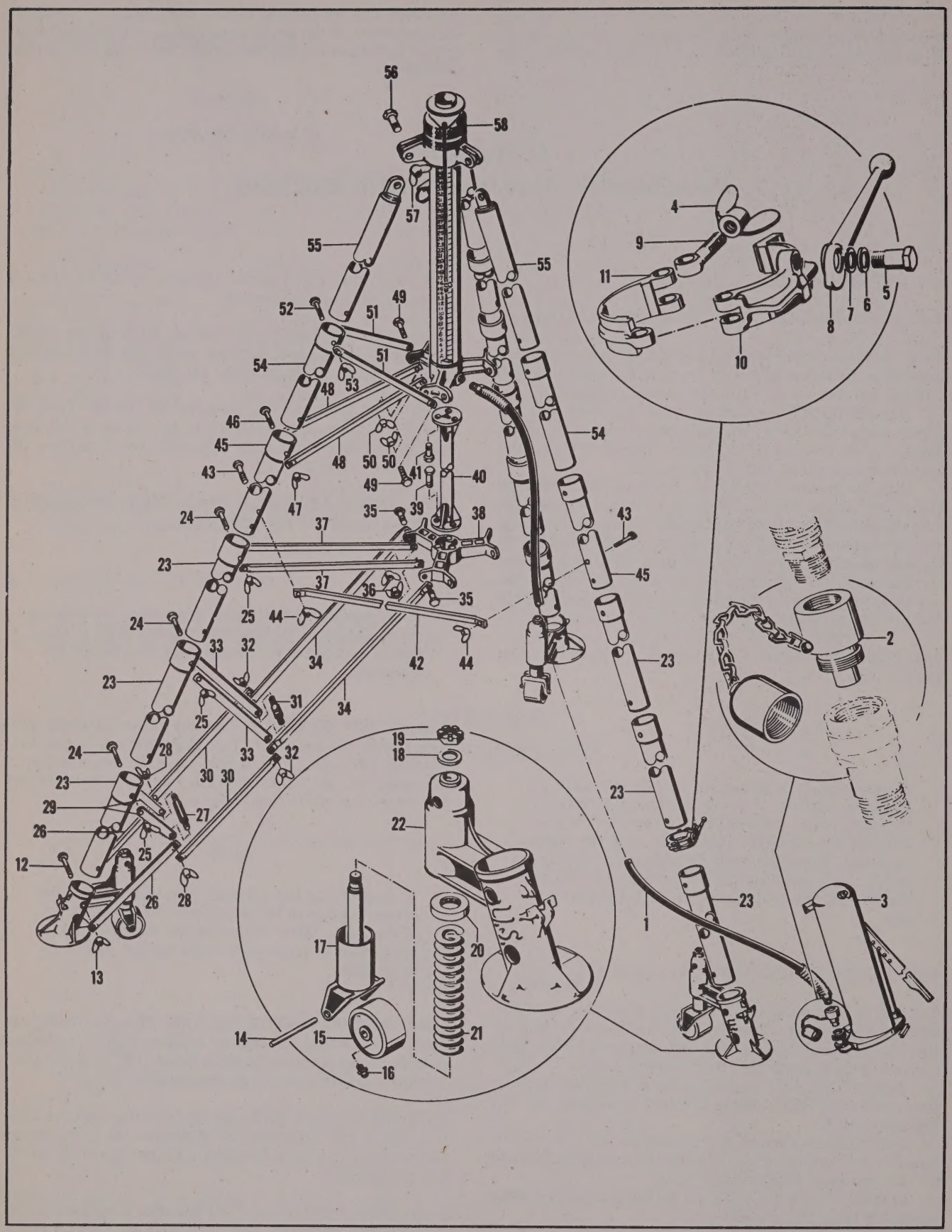

Figure 4-1. Type B-3 20-Ton Adjustable Tripod Jack Exploded

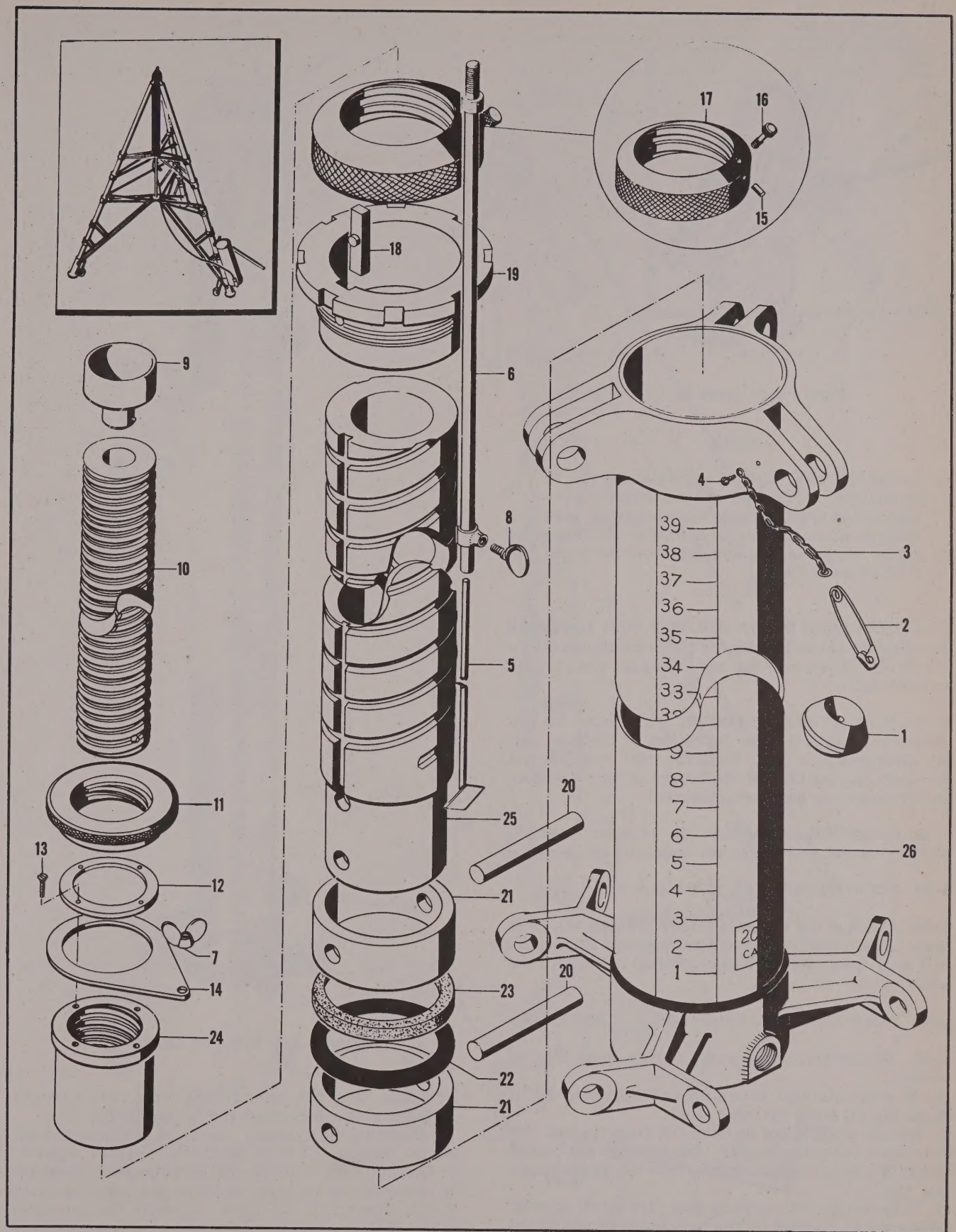

Figure 4-2. Lift Unit Exploded, Type B-3 20-Ton Jack

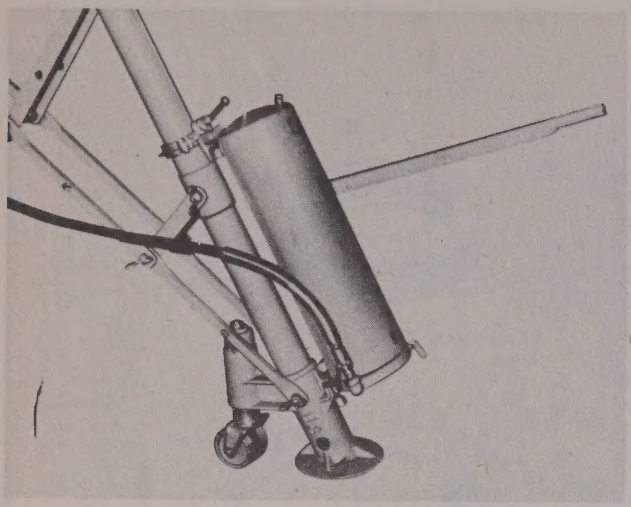

Figure 4-3. Pump Unit

NOTE

A stud is used to hold the key assembly (18) to the bearing nut (19), and when the threads of the bearing nut are free, upon disassembling, both units are removed at the same time by withdrawing the remaining ram assembly from the inside of the cylinder (28).

4-16. EXTENSION SCREW BEARING NUT. To remove the extension screw bearing nut (24), turn the extension screw (10) down into the nut to engage the threads and pull up.

4-17. RAM LOWER BEARINGS. To remove the two lower bearings (21) from the bottom of the ram, pull the two cross pins (20). Slide the "O" ring (22) and the back-up ring (23) off the bottom of the ram after the first bearing has been removed.

4-18. CYLINDER ASSEMBLY. The cylinder assembly (26) is a welded unit and is not disassembled.

4-19. FOOT ASSEMBLIES. (See figure 4-1.)

4-20. Remove the nut and washer (19 and 18). The caster assembly (17), spring and bearing (21 and 20) will drop free. Remove axle pin (14) to remove the caster (16).

4-21. PUMP UNIT. (See figure 4-5.)

4-22. Disassemble the pump unit in the following manner:

a. Remove air vent assembly and tilt pump unit to drain the oil from the reservoir.

b. Remove pin (10) and washers (11) from the link (12) to remove the pump handle. Depress spring-loaded ball in the top of the plunger to free the pump handle axis pin.

c. Remove pin (13) and slip link (12) up off of stud. (The stud is riveted on the underside of the base.)

d. Unscrew packing nut (15) from bearing (18). Remove back-up ring (16) and the "O" ring (17) from inside the bearing. Unscrew the bearing from the top of the cylinder (20) and remove the washer (19).

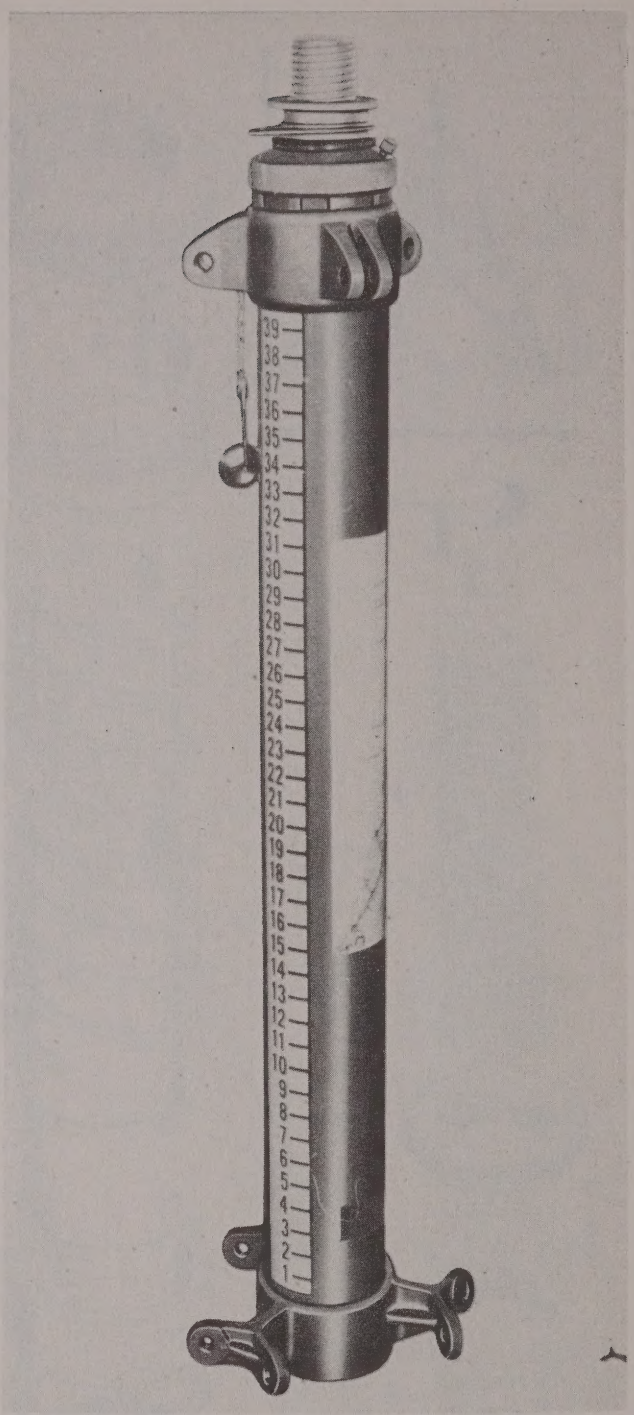

Figure 4-4. Lift Unit Assembly

e. Unscrew the cylinder (20) from the base and lift out the washer (21) from inside the cylinder support.

f. Detach the oil reservoir (22) from the base assembly by removing the six bolts, washers and copper gaskets which attach it to the base. Remove the velumoid gasket (26).

4-23. INTAKE VALVE. Remove the Allen hollow-head

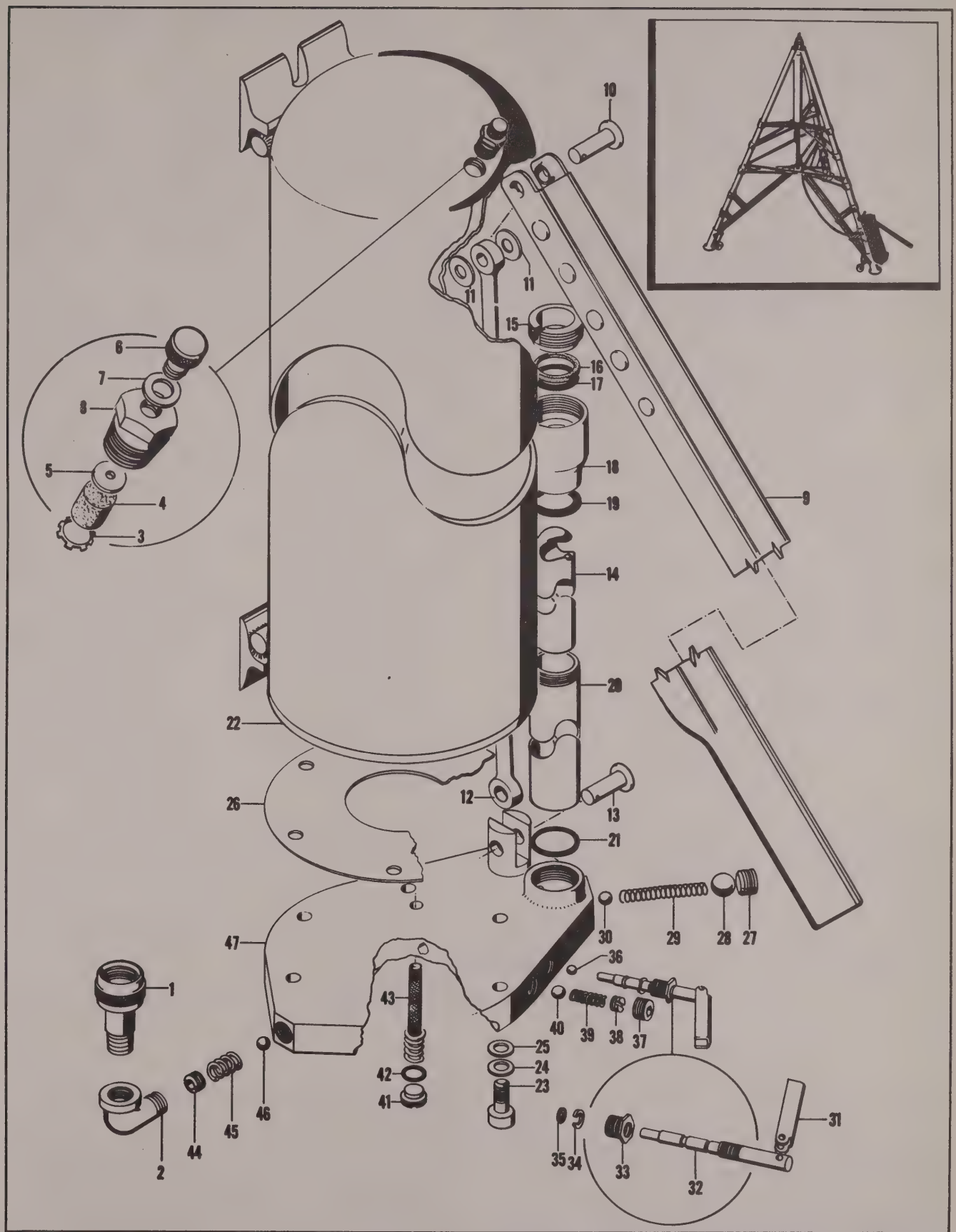

Figure 4-5. Pump Unit Exploded, Type B-3 20-Ton Jack

screw (27). Invert the base to allow the 1/2 inch ball (28), spring (29) and the intake valve (30) to drop out.

4-24. RELEASE VALVE. To remove the release valve, turn handle (32) counter-clockwise approximately three turns, then remove the nut (34). The release assembly unit will be withdrawn with the nut. Tilt the base to allow the 1/4 inch ball valve to drop out. To disassemble the release valve assembly, remove the "O" ring (35) and the snap ring (34) from the release valve stem (32); unscrew the stem from the nut.

4-25. SAFETY VALVE. Disassemble the safety valve from the base in the following manner:
a. Remove the socket pipe plug (37).
b. Remove the adjusting nut (38), spring (39) and the 11/32 inch steel ball (40).

4-26. DISCHARGE VALVE. To disassemble the discharge valve from the base, remove the steel elbow (2). Use a long screw driver and unscrew the plug (44); remove the spring (45) and the 11/32 inch steel ball.

4-27. OIL SCREEN. To remove the oil screen, invert the base. Remove the plug (41) and the "O" ring. Slide the oil screen out.

4-28. CLEANING.

4-29. PUMP UNIT. It is a known fact that dirt is the potential enemy of all hydraulic jacks. Therefore, each disassembled part of the pump unit must be thoroughly cleaned with clean white gasoline or kerosene before reassembly. Use compressed air to blow out all passages in the base, and the oil strainer screen (43).

4-30. LIFT UNIT. Clean the disassembled parts of the lift unit in the same manner as the pump unit.

CAUTION

Always use a lint-free rag to wipe the excess cleaning agent from the parts after they have been cleaned. Do not allow lint or loosened dirt to become lodged in any of the valves or oil passages which would restrict the free flow of the oil.

4-31. INSPECTION.

4-32. PUMP UNIT. (See figure 4-5.) Carefully check all the disassembled parts for wear, distortion, metal burrs, and to make certain all dirt has been removed. Pay particular attention to the threads on the extension screw (10), the upper ram bearing (19), and the ram (25). Check the internal threads on nuts (11, 17 and 24) and bearing (19).

4-33. LIFT UNIT. (See figure 4-2.) Inspect all disassembled parts for wear, material failure, burrs, rust and corrosion. Make sure all dirt has been removed. Check the dimensions of the piston (14) and cylinder (20) to determine clearance. (Refer to the Table I, paragraph 1-9.) Examine the steel valve balls for pits or any other surface imperfection. Pay particular attention to the valve seats. These should be perfectly smooth. Use a light and inspect the inside of the pump hose. Check the outside of the hose carefully for breaks in the surface which might burst under pressure.

NOTE

When inspecting the pump hose, one man will hold a light on one end of the hose while another man looks through the entire length to determine that no restriction is present which would retard the free flow of the oil from the pump to the lift unit or back.

4-34. OIL STRAINER. Make certain the oil strainer screen (43) is clean and that no breaks have occured in the wire mesh.

4-35. TRIPOD STRUCTURE. Check the leg extensions and cross braces of the tripod structure for any weakened condition such as bends, dents or other distortion.

SECTION V
REPAIR AND REPLACEMENT

5-1. PUMP UNIT. (See figure 4-5.)

5-2. All "O" type packings (17, 35 and 42) and back-up "V" rings (16) as well as washers (19) and gasket (26) should be replaced after each disassembly.

5-3. PISTON AND CYLINDER. If piston or cylinder have worn beyond the tolerances shown in Table I, paragraph 1-9, replace with new ones. Too much clearance between the piston and cylinder will quickly break down the new "O" rings and back-up "V" packings.

5-4. VALVES. The steel balls function as valves, and the balls as well as their seats in the pump base should be perfect. If there is any doubt about the ball being perfect, replace it. To reface the seats, fit reamer to size of hole and ream 1/32 to 1/16 inch deep.

5-5. RESEATING VALVES. To re-seat, place the pump base in a vise so the opening is in a vertical position,

then drop proper size ball in the hole. Tap the ball lightly with a brass rod to form a new seat. Remove and discard the ball used.

5-6. The intake valve is a 11/32 dia. steel ball (30) held in place by the spring (29) which opens to let oil enter the passageway leading to the bottom of the pump. The 1/2 inch dia. steel ball (28) is held tightly against its seat by the Allen head set screw (27) and prevents oil escaping from the hole when the pump is actuated. Replace any ball which is not perfectly round.

5-7. The discharge valve is also a 11/32 inch dia. steel ball (46) held in place by a spring (45) and backed up by a retaining plug (44). The valve opens when the oil pressure, exerted by the pump against the ball, exceeds the pressure of the spring on the ball. The valve prevents oil returning to the pump from the lift unit, and its function is to hold up the load. Any leak will permit the ram to descend, therefore the ball must seat perfectly. Repair as stated in paragraph 5-4.

5-8. The release valve is a 1/4 inch diameter steel ball (36) held in its seat by a screw-type plunger (32). It is manually operated. The snap ring (34) prevents the stem (32) from being unscrewed too far out of the nut (33). The "O" ring (35) helps seal in the oil. When the stem is turned counter-clockwise, pressure is reduced on the ball which permits the oil in the lift unit to by-pass the pump and return to the reservoir. When the ram loses height in operation, it is possibly caused by the release valve being improperly closed, or due to leaking because of an imperfect ball or irregular seat. Discard the "O" ring (35) after each disassembly and replace it with a new one.

5-9. The safety valve is a 11/32 inch diameter steel ball (40) held in place by a spring (39) and adjusting nut (38). It is backed up by a pipe plug (37) which automatically returns the oil to the reservoir when the oil pressure reaches limits beyond the capacity of the jack.

CAUTION

Do not disassemble the safety valve unless there is equipment available to test the valve.

5-10. Make certain the ball seats properly. Reface seat, and re-seat if necessary. When re-assembling valve, set the spring pressure by tightening the adjusting screw so that the valve will open when the oil pressure is 3050 to 3400 pounds per square inch. Make sure pipe plug does not come in contact with adjusting nut, or pressure may be effected.

NOTE

Use pressure gage attached to pump when testing safety valve during screw adjustment.

5-11. The oil strainer (43) is a fine wire-mesh cylinder held in place by a plug (41) and sealed by an "O" ring (42). There should be no leaks around the plug. Replace the "O" ring after each disassembly. The spring should hold the screen tightly into the hole when the plug is installed. If the screen is defective, replace it with a new one.

5-12. LIFT UNIT ASSEMBLY. (See figure 4-2.)

5-13. Replace all "O" rings (22) and "V" packing (23) after each disassembly.

5-14. The extension screw (10) must turn easily up and down by hand. Similarly the screw lock nut (11) should turn easily on the screw (10). Roll the threaded part of the screw on a flat surface; all threads should touch the flat surface to insure against distortion. Screw should be replaced, if the screw binds, when turned by hand, because of distortion, or shown signs of unusual wear.

5-15. If ram lock nut (17) does not turn freely of its own weight on the spiral groove of the ram, re-inspect for burrs and remove them. If it still binds, re-check it for distortion or other damage. If necessary to replace screw (16) because of improper threading, withdraw groove pin (15), install new screw and new pin to hold screw in place. Measure inside diameter of cylinder (26). If clearances exceed maximum shown in Table I, paragraph 1-9, install new bearings.

5-16. TRIPOD STRUCTURE. (See figure 4-1.)

5-17. Replace any damaged, defective or worn braces or leg extensions. Replace bolts or wing nuts if threads are defective. Foot assembly swivel caster should operate freely. Make certain the hose assembly (1) is not damaged, and that there are no bulges or cracks. Be sure the connector (2) does not leak oil. If leakage around the connector is noticed after the hose and oil have been re-installed, disconnect the hose and install a new connector.

SECTION VI
REASSEMBLY

NOTE

In reassembling the jack, the method of disassembly described in Section IV is now reversed, i.e. the first parts disassembled are the last to be reassembled. The following precautionary measures should be observed in reassembly.

6-1. PUMP UNIT. (See figure 4-2.)

6-2. Install the oil screen plug (41). Make sure that "O" ring (42) is not squeezed into the hole from under the shoulder of the plug when tightened. Since the opening is on the under side of the base, oil leaks will not be as noticeable as if it was in full view. Use Permatex No. 2 or white lead on the threads of the pipe plug.

6-3. Install the release valve assembly. Be careful not to damage the "O" ring when inserting the stem (32) into the port hole.

NOTE

When installing the intake valve spring (29), the discharge valve spring (45) or the safety valve spring (39) they should fit straight in the hole with sufficient clearance all around on top of the ball.

6-4. Use Permatex No. 2 or white lead on the threads of plug (37) and install it. Elbow (2) should be installed after reassembly is complete and pump is tested.

6-5. The nut (15), "V" packing ring (16), "O" ring (17), bearing (18), and washer (19) should be slipped over the bottom of the pump piston assembly (14); then the bottom of the piston inserted into the top of the pump cylinder (20). Press the washer (19) up into the lower part of the bearing (18). Press the bearing down over the top of the cylinder and screw down the bearing. Push the "O" ring (17) and "V" packing (16) down into the upper part of the bearing and seat the "V" over the "O" ring. Press the nut (15) down inside the bearing and screw down tight.

6-6. Partially fill reservoir with AN-O-7 oil through air vent hole in reservoir and actuate pump handle to clear passages of air. Continue pumping lightly until oil comes out the valve port in the pump base where elbow (2) is installed. Then fill reservoir until level is about 1-1/2 inches from air vent hole. Install air vent assembly and tighten.

6-7. Install a 5000 p.s.i. capacity gage in the discharge valve port (where elbow (2) is installed). Actuate the pump handle to see if the safety valve releases at 3050 to 3400 p.s.i. Remove gage and install elbow (2) with Permatex No. 2 or white lead on the threads.

6-8. LIFT UNIT ASSEMBLY. (See figure 4-2.)

6-9. Press the extension screw bearing (24) into the top of the ram (25). Place one lower ram bearing (21) over the lower end of the ram, followed by the "O" ring packing (22) and the "V" back-up ring (23). Install the second lower ram bearing (21). Align the cross holes in the bearings with the cross holes in the ram and install cross pin (20) through each bearing.

6-10. Install the lug of the key assembly (18) into the hole in the upper bearing (19), then slip them over top of the ram with key inserted, long leg downward, in the longitudinal groove on the ram. Place upper bearing on ram while putting the ram lock nut (17) over the top of the ram with the screw (16) riding in the spiral groove. Rotate the lock nut part way down the ram.

6-11. Place the whole ram assembly inside the top of the cylinder. Be careful not to damage the "O" ring or "V" ring. Press the ram assembly down until the upper bearing (19) contacts the threads inside the cylinder. Screw bearing tight. Rotate lock nut (17) to the top of the ram while pressing ram down into the cylinder.

6-12. Place rise indicator collar (14) on the top of the ram, and place the rise indicator collar clamp (12) over the collar. Align the collar holes with the holes in the extension screw bearing nut and install 4 screws (13) to hold clamp in place.

6-13. Install extension screw lock nut (11) over the lower end of the screw (10). Insert lower end of screw into top of ram and turn screw (10) by hand. Insert socket assembly (9) into top of extension screw.

6-14. Install rise indicator rod (5) into rise indicator tube (6) and tighten thumb screw (8). Place threaded end of rise indicator tube (6) through hole in collar (14) and install wing nut (7). Place jack pad adapter (1) on top of socket (9) when ready to try out lifting load.

6-15. TRIPOD STRUCTURE. (See figure 4-1.)

6-16. Place lift unit on ground; support it so the lugs at the top and bottom are available to attach the legs and braces. The tripod structure can be assembled completely, or it may be assembled for various heights. By consulting figure 4-1, any height may be attained by installing the several sets of legs with corresponding braces, starting at the top. Attach the top legs (55) by means of bolts (56) and wing nuts (57). Attach ends of braces (51) to bottom of lift unit cylinder with bolts (52) and nuts (53), and attach the other end of the braces to the bottom end of the legs (55), either with the foot assembly or the leg extension (54).

6-17. By attaching the foot assemblies to the top legs, the closed height of the jack would be 52 inches. However, by attaching the leg extension (54), adding the brace (48) and attaching the foot assembly to the bottom of the leg extension, the closed height would be 18 inches higher, or 70 inches overall.

NOTE

The foot assembly is always installed at the bottom of the lowest leg installed.

6-18. Further assembly of supporting legs to attain additional height will require the installation of the tension bar (40) and web (58) to attach the braces. Links (33 and 29) are used in conjunction with braces (30 and 26) to complete the final total assembly of the jack.

6-19. BLEEDING PUMP AND LIFT UNIT. (See figure 4-1.)

6-20. When the tripod structure has been completely

assembled, or as far as desired, place the jack in an upright position. The pump assembly (3) can then be attached by placing the lower lug (welded to the reservoir) into the support on the foot casting (22), and attaching the pump clamp assembly to the leg structure so the clamp cam (8) will engage the upper lug (welded to the reservoir).

6-21. Attach the male connector assembly (2) to the female connector assembly (see figure 4-3, index 1) located at the bottom of the pump assembly. Then attach one end of the hose assembly (1) to the connector assembly (2) and tighten the release valve stem (figure 4-3, index 32).

6-22. Hold the free end of the hose up in the air and actuate the pump handle to eject the air in the hose. Continue pumping lightly until oil seeps from the hose, then attach the free end to the opening in the bottom of the lift unit cylinder.

NOTE

Be sure ram is fully lowered before attaching hose.

6-23. CHECK AFTER ERECTION.

a. Tightly close air vent assembly in pump reservoir.
b. Check hose connections between the pump and lift unit.
c. Inspect all structural braces for rigidity, and tighten all wing nuts. See that foot casters swivel freely.
d. Lubricate all moving or bearing parts with light oil, including wheel axles, caster stem, pump fulcrum pin and ram extension screw.

SECTION VII
TEST AFTER OVERHAUL

7-1. TESTING. After reassembly, test the jack under full load conditions (unless pump and lift unit have been tested separately under load conditions after their respective overhauls).

7-2. RAISING. During test, the pump must be actuated to fully extend the ram.
a. Hold pressure against applied load (40,000 pounds) for not less than 15 minutes. There shall be no apparent settling.
b. No leakage should occur at packings around pump piston or at top of the lift unit cylinder.
c. During raising operation, observe to insure that ram lock nut rotates freely on the ram and remains positioned on top of the cylinder by its own weight.
d. There must be no distortion, bending, swaying, or permanent set in ram or screw extension during the test.

7-3. LOWERING.
a. Rotate ram lock nut to top of ram and secure in position by tightening the knurled screw.

NOTE

The threads of the ram lock nut and the spiral threads on the ram are so mated that when the ram is ascending, the ram lock nut rides free on top of the cylinder. However, the ram cannot descend unless the lock nut is spiraled up to the top of the ram. Thus, the ram lock nut prevents the load from falling in case of hydraulic failure at any time during the lift.

b. Release pressure by opening pump release valve to control the speed of descent.

CAUTION

Open release valve slowly.

c. Make sure that ram fully compresses of its own weight.
d. Fully depress extension screw by hand.

7-4. CORRECTION. The failure of any part to perform perfectly should be investigated and corrected by disassembly and re-inspecting.